

U.S. Patent Application Serial No. 10/648,356
Amendment filed August 29, 2005
Reply to OA dated May 27, 2005

REMARKS

Claims 1 - 7 have been canceled without prejudice or disclaimer. The applicants respectfully submit that no new matter has been added. It is believed that this Amendment is fully responsive to the Office Action dated May 27, 2005.

The specification has been objected to due to certain informalities, which the Examiner deemed needed correction, as set forth on page 2 of the outstanding Action. The applicants respectfully request reconsideration of this objection.

The applicants respectfully submit that the amendments to the specification obviate the outstanding objections to the specification. Accordingly, the withdrawal of the outstanding objections to the specification is in order, and is respectfully solicited.

Claims 8 - 20 are currently pending in this patent application, claims 1 - 7 having been canceled without prejudice or disclaimer, and claims 8 and 16 being independent claims.

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Claims 3 and 10 have been objected to because, according to the Examiner, such claims “are not commensurate with the specification.” The applicants respectfully request reconsideration of these objections.

Claim 3 has been canceled without prejudice or disclaimer. Thus, the outstanding objection to claim 3 is now moot. As to claim 10, the applicants have amended the specification in response to the Examiner’s outstanding objection to this claim. Accordingly, the withdrawal of the outstanding objections to claims 3 and 10 is in order, and is therefore respectfully solicited.

Claims 3 and 10 stand rejected under 35 USC §112, second paragraph, for the specific reasons set forth on page 3 of the outstanding Action. The applicants respectfully request reconsideration of this rejection.

The applicants’ above comments with respect to the specification and the language of claims 3 and 10 are similarly applicable in traversing the outstanding rejection under 35 USC §112, second paragraph. Accordingly, the withdrawal of the outstanding indefiniteness rejection under 35 USC §112, second paragraph, is in order, and is therefore respectfully solicited.

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As to the merits of this case, the following rejections are set forth:

- (1) claims 1, 2 and 4 - 7 stand rejected under 35 USC §103(a) based on Anderson (U.S. Patent Publication No. 2001/0031365);
- (2) claims 8, 9, 11 - 14, and 20 stand rejected under 35 USC §103(a) based on Anderson in view of Okada (U.S. Patent No. 5,777,792);
- (3) claim 15 stands rejected under 35 USC §103(a) based on Anderson in view of Okada, and further in view of Amano (U.S. Patent No. 6,222,967);
- (4) claim 16, 17 and 19 stand rejected under 35 USC §103(a) based on Anderson in view of Okada; and
- (5) claim 18 stands rejected under 35 USC §103(a) based on Anderson in view of Okada, and further in view of Yoshizawa (U.S. Patent No. 5,912,504).

The applicants respectfully request reconsideration of these rejections.

As indicated above, claims 1, 2 and 4 - 7, along with claim 3, have been canceled without prejudice or disclaimer. Thus, the outstanding rejection of claims 1, 2 and 4 - 7 under 35 USC §103(a) based on Anderson (U.S. Patent Publication No. 2001/0031365) is now moot. Thus, the outstanding rejection of these claims under 35 USC §103(a) based on Anderson (U.S. Patent Publication No. 2001/0031365) is in order, and is therefore respectfully solicited.

As to the remaining claims, the applicants submit that their instant claimed invention is intended to reduce stress in an optical semiconductor device and reduce stress in an optical multilayer film in order to obtain stabilized output by specifically defining the multilayer film composed of layers of selected materials and thicknesses thereof whereby desired optical characteristics can be obtained.

Great stress in the optical multilayer film may cause stress in the optical semiconductor device. Stress in the optical semiconductor device deteriorates the performance with age. Thus, it is required to reduce or avoid stress in the optical semiconductor device (see, the applicants' discussion from line 15, page 9 through line 6, page 10 of the specification).

The applicants' instant claimed invention pays attention to difference in the refractive index between laminated layers, and employs a multilayer made having an MgF layer and a TiON layer, in which TiON has excellent stress controllability. If attention to only the differences in the refractive index is paid, the double-layer structure of MgF and TiON is enough to achieve the desired optical characteristics. However, the MgF film of the double-layer structure is required to have a great thickness, and the stress controllability thereof is not good (see, the applicants' discussion starting from line 29, page 6 through line 20, page 7 of the specification).

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In other words, the applicants' instant claimed invention employs an optical multilayer film that includes an additional layer along with the MgF layer and the TiON layer so that the multilayer film has multiple reflection planes, and the thickness of the MgF can be reduced to less than 1/4 wavelength. This thickness of the MgF film contributes to reduction stress applied to the optical semiconductor device.

In contrast, Anderson teaches a multilayer structure of MgF and TiON. However, Anderson is limited to antireflection films applied to windows of automobiles and displays, and fails to teach or suggest any applications to optical semiconductor devices. Further, Anderson is silent to film thicknesses.

As to the secondary reference of Okada, this reference teaches an antireflection film of a double-layer structure of TiON and MgF applied to a light-incident plane or light output plane. However, Okada does not teach or suggest problems arising from the double-layer structure of TiON and MgF and any solution to solve such problems.

Accordingly, even if, *arguendo*, the teachings of Anderson and Okada can be combined in the manner suggested by the Examiner, such combined teachings would still fall far short in fully meeting the applicants' claimed optical semiconductor device, as set forth in each of independent claims 8 and 16. Thus, a person of ordinary skill in the art would not have found the applicants' claimed invention, as recited in each of independent claims 8 and 16, obvious based on the teachings of Anderson and Okada, singly or in combination.

As to the other secondary references, Amano is narrowly relied upon for teaching, according to the Examiner, the sealing of a semiconductor device to achieve reliability and to improve dimensional accuracy of alignment of multiple optical components^{1/}, while Yoshizawa is narrowly relied upon for teaching a semiconductor device in the form of a photo sensor sealed by a light transmitting resin^{2/}. However, such teachings do not supplement the above-discussed deficiencies or drawbacks in the teachings of Anderson and Okada in failing to fully meet the applicants' claimed invention, as recited in independent claim 8 from which claim 15 depends or in independent claim 16 from which claim 18 depends.

^{1/} See, lines 7 - 9, page 8 of the outstanding Action.

^{2/} See, lines 6 and 7, page 10 of the outstanding Action.

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In view of the above, the withdrawal of the outstanding obviousness rejections under 35 USC §103(a) based on Anderson (U.S. Patent Publication No. 2001/0031365) in view of Okada (U.S. Patent No. 5,777,792), or in further combination with Amano (U.S. Patent No. 6,222,967) or Yoshizawa (U.S. Patent No. 5,912,504) is in order, and is therefore respectfully solicited.

In view of the aforementioned amendments and accompanying remarks, specification, claims, as amended, are in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicants' undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

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In the event that this paper is not timely filed, the applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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